

Washington State On-Site Wastewater Technical Review Committee

Minutes for the
April 17-18, 2002 Meeting
Approved on June 5, 2002 by Vote of the Committee



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Note: The minutes periodically refer to “Items.” Items are documents containing information on a subject being discussed. Items, with their descriptions/titles, are noted at the end of the minutes in the section entitled “List of Meeting Materials.

MEETING ATTENDEES

Members Present

1. Kevin Barry, Eastside Env. Hlth
2. Scott Jones, Engineers
3. Melanie Kimsey, Dept of Ecology
4. Eric Knopf, Designers, Installers, O&M
5. Bob Monetta, Wash. Assoc. of Realtors
6. Tom Rogers, Proprietary Devices

DOH Staff

1. Laura Benefield, Wastewater Mgt Program
2. Kelly Cooper, Leg. & Regulatory Office
3. Virginia Darrell, Wastewater Mgt. Program
4. John Eliasson, Wastewater Mgt Program
5. Selden Hall, Wastewater Mgt Program
6. Dave Lenning, TRC Coordinator

Guests Who Signed In or Presented

1. Dale Dunnells, Infiltrator Systems, Inc.
2. Gifford Brown, Infiltrator Systems Inc.
3. Peter Lombardi, Orenco Systems Inc.
4. Keith Grellner, Bremerton-Kitsap Health District
5. Stephen Wecker, Onsite Consulting Services
6. Peter Burgoon, WQE (Day 2 only)

INTRODUCTION

Bob Monetta, Chair, called the meeting to order at approximately 10:30 a.m. on April 17, 2002 and at 8:15 am on April 18, 2002 in the meeting room of the BEST Inn in Ellensburg. The meeting on Day 1 began with brief introductions by each committee member, DOH staff, and the interested parties in the audience.

MINUTES

February 6-7, 2002 Meeting Minutes Adoption – By unanimous vote, the committee approved the February 6-7, 2002 TRC meeting minutes without changes.

ADMINISTRATIVE MATTERS

1. Dave Lenning indicated that a format needed to be developed for transmitting TRC recommendations or conclusions to the RDC and that someone should be designated to present them. While it was understood that the RDC made the final call, unless anything changed the format would be:
 - Each technical issue would be presented using the question format similar to that suggested by Tom Rogers at the last meeting – where are we now, why are we looking at this issue, where should we go, how should we get there. Kelly Cooper suggested that the reason for suggesting change to a current requirement or adding a new requirement should be clearly stated with as much supporting documentation as possible.
 - The presentation should include the question/decision tree for each issue and the committee responses/decision
 - The staff report would be attached in case an RDC member wanted to read the detail.
2. Dave indicated that someone needed to be designated to present the TRC conclusions to the RDC. The committee decided that Dave Lenning should be the primary spokesperson for the TRC when TRC conclusions are presented to the RDC. Melanie Kimsey and Kevin Barry, as well as RDC members who attend the TRC meetings, will be available to support Dave.

SUMMARY OF TECHNICAL DISCUSSIONS

1. **Technical Issue #2 – Hydraulic loading rates**
 - a. John went over the “To Do” list resulting from the February meeting for this issue.
 - What other states were doing looking at soil characteristics other than texture – Item #1 includes samples of how several other states are using various soil morphological features to size OSS.
 - Send out papers from the last decade showing E. Jerry Tyler’s progression in dealing with hydraulic loading rates. Item #1 includes several papers.
 - Relationship between hydraulic loading rates and dosing regime – nothing found

- Relationship between hydraulic loading rates and method of distribution – nothing found (other places allow increases in loading rates when pressure distribution is used, but for reasons other than just the method of distribution)
 - Coarse fragments and effect on loading rates, especially extremely gravelly soils (will be handled when dealing with Technical Issue #6 – Type 1A soil issues)
 - Talk to Craig Cogger and Lisa Palazzi – Item #1 includes copies of e-mails between John Eliasson and Dr. Cogger.
- b. **Where are we now?** For hydraulic loading rates, Washington uses what the 1980 EPA manual has, with a couple modifications in the coarse and fine ends of the textural soil spectrum
- c. **Should sidewall be included as an active surface in sizing the SSAS?** As decided in the February meeting, No.
- d. **Should we make any adjustments to our existing hydraulic loading rates per the current WAC 246-272?** What problems do we have with the existing rule?
- Loading rates for pretreated effluent are not included
 - There is concern when the soils are a fine or very fine sand
 - There is a concern that the current loading rates on sands are too high. There have been numerous problems with mounds and sand filters using specified sands, as well as gravity or pressure distribution systems installed in sands.
 - There are no allowances for well-developed structure other than for silt loams.
- e. There was a consensus that the following changes in the current loading rate table in WAC 246-272 be suggested:
- Combine soil types 2A and 2B into soil type 2 and give it a loading rate of 1.0 gallons/square foot/day. Delete the reference to ASTM C33 soils.
 - Move fine sands from Type 3 soils to Type 4
 - Move very fine sands and loamy very fine sands from Type 4 soils to Type 5
 - Add another column for loading rates when more highly treated effluent is being used (the numbers depend on conclusions reached during the discussion of Technical Issue #4, Pathway 1 (reductions when using highly pretreated effluent)
 - In addition to the very fine sands and loamy very fine sands, Type 5 soils should include silt loams, sandy clay loams, clay loams, and silty clay loams with moderate or strong structure.
 - Soil type 5 should have a loading rate of 0.4-gallons/square foot/day.
 - Soil type 6 should include silt loams, sandy clay loams, clay loams and silty clay loams with a weak structure.
 - Add footnotes:
 - Soils with a platy or massive structure shall not be used.
 - Soils with expanding clays shall not be used.

2. **Presentation on saturated flow and capillary action** – Melanie Kimsey

- a. Melanie distributed a handout (See Item #2)
- b. During her presentation, she emphasized the following key points:
 - Horizontal flow occurs only in saturated zones, not in the capillary zone where the flow is primarily vertical
 - Water in the capillary zone is under negative pressure (anything above the water table).

- Water below the water table is under positive pressure

3. Technical Issue #3 – Organic loading rates

- Virginia Darrell indicated she had looked at several more papers since the last meeting. She also announced there were some corrections in her handout (See item #3). A new copy will be sent out.
- She gave her personal conclusion that while organic loading was very important, there was limited data that gave direction about what to do.
- To help the committee better understand the topic and assist their decision-making process, Virginia asked several questions. Her questions and the committee's responses follow:
 - **Does organic strength affect loading rates?** Yes
 - **Should organic loading be a consideration in designing infiltrative surfaces?** Yes
 - **What options exist for the design professional?**
 - Pretreat
 - Source reduction
 - Increase size based on an organic loading rate
 - **Based on the literature review, do we have enough information to incorporate organic loading rates (the third option on the previous question) into rule?** No
- Eric Knopf indicated that from his observation, it isn't unusual to have "refailures" when the BOD₅ is above 300 mg/l.

4. Technical Issue #5 – Wastewater Quality/Strength/Content

- Laura Benefield presented the work she had done on wastewater quality/strength/content. See Item #4. The topic pertains primarily to trying to define what residential and non-residential wastewater is. One of the primary drivers for this topic is the requirement in WAC 246-272-11501(3) to characterize the wastewater strength as part of the design process.
- Laura discussed the dilemma of whether raw wastewater (septic tank influent) or septic tank effluent should be used in the definition of residential wastewater. Sampling influent strength is extremely variable; thus, it is difficult and rarely done. However, when design professionals are looking at a potential source of wastewater for which they need to design a system, they must at least make some estimate of influent, since they don't know what the effluent quality will be.
- Laura indicated that the literature shows wide variability in influent and effluent concentrations of different parameters.
- Laura indicated that technologies claiming to be able to handle high strength wastewater must have some type of testing protocol to determine if they can reliably produce acceptable effluent quality. She briefly described a process promulgated by USEPA and NSF for verifying claims for various technologies (the ETV – Environmental Technology Verification - process).
- Laura also indicated a need for clarifying the permitting process for non-residential wastewater streams and the design requirements for non-residential sources. Examples include dog kennels, restaurants, mini-marts, etc.

- f. To help the committee better understand the issue and make decisions, Laura asked a set of questions. Following is a modified set of questions resulting from the discussion and the committee's responses/decisions:
- **Do we need to define numerical values for residential strength wastewater (influent)?** No.
 - **Do we need to define numerical values for residential strength septic tank effluent?** Yes
 - **If yes, what should the values be?** Will be discussed in the session on treatment standards (Technical Issue #1)
 - **How do we define high strength septic tank effluent?** Strength higher than residential strength septic tank effluent
 - **To verify technology, is an existing testing protocol available?** Yes
 - **If yes, which one(s)?** The ETV program
 - **Is this protocol adequate?** Don't know yet – a copy of the ETV protocol will be sent to committee members
 - **Do we need to develop another testing protocol?** Don't know yet.
 - **Should this be placed into rule?** Don't know yet.
 - **At a minimum, what parameters need to be included?** BOD₅, TSS, FOG. Temperature, pH, dissolved oxygen and other parameters maybe should be considered also.
 - **What system design criteria are needed to address high strength wastewater?** Require proven pretreatment (don't know whether we have an adequate testing protocol yet) and require monitoring
 - **What should be done to simplify the permitting process and design requirements for non-residential wastewater sources?** The Department of Ecology has responsibility for animal operations, yet systems serving such facilities are handled by local health jurisdictions that get little assistance while providing that service. This is true of other facilities such as day care facilities, restaurants, mini-marts, small meat-cutting operations, etc. Better coordination between the various agencies to clarify the authority and requirements.

Day 2, April 18, 2002

Dave presented a brief review of the discussion and decisions made during the first day of the TRC meeting.

5. Technical Issue #4, Pathway 1 – Disposal Component Reductions due to highly pretreated wastewater

- a. Selden Hall handed out an additional sheet (Item #5) containing questions designed to help the committee better understand the issues and make decisions. Following are those questions and the committee's responses/decisions:
- **Where are we now with disposal component reductions based on highly pretreated wastewater?** With a vertical separation of at least 24 inches, a 50% reduction in sizing (100% increase in loading rate) is permitted for drainfields receiving effluent that has less than 10 mg/l BOD₅, 10 mg/l TSS. When vertical separation is reduced below 24 inches, a fecal coliform standard is added.

- **Why are drainfield reductions used?** Because the reduction is permitted and because smaller installations can be made taking up less area
 - **Should we continue to define highly pretreated wastewater as 10/10 (no fecal coliform requirement)?** Yes, though this may be revisited after discussion of Technical Issue #1 (Treatment Standards 1 & 2).
 - **What does the scientific literature say about the hydraulic and treatment performance, as well as the longevity of drainfields loaded with highly pretreated wastewater?** Selden's conclusions and recommendations are noted on page 6 of his report.
 - **Based on the literature review, should reductions for highly pretreated wastewater be allowed?** Hydraulically, yes. There were some initial concerns when considering treatment.
 - **If reductions are allowed:**
 - **What should the reduction allowance be?** Same as now – a 50% reduction for 10/10 effluent.
 - **Should 100% primary and reserve absorption areas be required?** Yes – 4 No – 2 (Tom Rogers, Scott Jones)
 - **Should O&M be required?** Yes
 - **When reductions are allowed for Pathway 1, should additional reductions due to Pathway 2 be allowed?** Yes – 1 (individual not noted) No – 5
 - **If a reduction is taken for Pathway 1, can a reduction in vertical separation also be taken?** Yes – 5 No – 1 (Melanie Kimsey)
 - **What methods of distribution should be required for a receiving drainfield when a reduction is taken for Pathway 1?** The receiving drainfield shall be designed to assure unsaturated flows below the drainfield. Currently, this will require a time-dosed, pressure distribution system.
- b. Decisions made by the committee on this Technical Issue and Technical Issue #2 (Hydraulic loading rates) result in the following hydraulic loading rate table:

Soil Type	Soil Textural Classification Description*	BOD ₅ > 10 mg/l (Gal/ft ² /day)	BOD ₅ < 10 mg/l (Gal/ft ² /day)
1	Coarser than coarse sands	TI #6	TI #6
2	Coarse and medium sands	1.0	2.0
3	Loamy coarse sands, loamy medium sands	0.8	1.6
4	Fine sands, loamy fine sands, sandy loams, loams	0.6	1.2
5	Very fine sands, loamy very fine sands; OR silt loams, sandy clay loams, clay loams and silty clay loams with a moderate or strong structure	0.4	0.8
6	Silt loams, sandy clay loams, clay loams and silty clay loams with a weak structure**	0.2	0.4

*Soils with a soil textural classification having a platy or massive structure shall not be used.

**Soils with expanding clays shall not be used.

6. Technical Issue, #1 – Treatment Standards 1 & 2

- a. John Eliasson gave a brief introduction into the current status of performance standards around the United States using his report as the basis (Item #6). He told of work being done by Hoover and others to develop a series of performance standards that would require higher levels of treatment as the vulnerability of a site or the site's resource value increased. He showed two charts, one that showed a chart from Hoover's 1998 paper and the second a chart showing adjusted proposed treatment standards. These are in Item #7.
- b. John gave a brief history of treatment standards in the State of Washington and the derivation of the current Treatment Standards 1 & 2.
- c. The following is to be sent to committee members:
 - The ETV protocol
 - The two charts from John's presentation that were not in his report (the charts in Item #7)
 - Chapter 2 of the new EPA on-site design manual **(it actually is chapter 3)**
- d. John developed a set of questions in his report to help the committee better understand the issue and make decisions. While there wasn't much time to discuss this topic, the committee did review the questions and give responses. More work is required on this issue. Following are those questions and the committee's responses:
 - **Should we continue using treatment standards to manage on-site sewage systems?** Yes
 - **If yes, should we continue to set the standards at the point prior to release into the soil?** Yes
 - **If yes, should we set standards at some point in the receiving environment?** No
 - **Is there a need to make adjustments to our existing standards?** Yes
 - **If yes, what adjustments should be made?**
 - **Additional parameters?** Yes, but need to discuss further
 - **Additional levels?** Yes, but need to discuss further
 - **Different maximum allowable concentrations?** Yes, but need to discuss further
 - **Add mass loading of the parameters??** No, based on decisions made on Technical Issue #3 (Organic Loading Rates)
 - **What are the important parameters and indicators of public health and environmental significance?** Fecal coliform bacteria, TSS, BOD, N, P, FOG
 - **How do we match risk reduction strategies to the actual receiving environmental risk factors?** Develop site vulnerability and treatment standard matrixes as noted in the Hoover plan in Item #7. This question needs to be addressed further during the discussion of Technical Issue #9 (Table IV issues).

7. Technical Issue #4, Pathway 2 – Disposal Component Reductions due to special features and applications of drainfield products

- a. Selden Hall presented the results of literature search by summarizing his report (Item #8). He described the various gravelless technologies being discussed and showed pictures of each. He indicated that he'd evaluated three types of studies in preparing his report for the committee: lab studies, field-scale research, and field monitoring.

- b. All decisions made by the committee on this topic will have to be revisited as only 5 committee members remained. The committee's procedural manual requires a minimum of 6 individuals to make a quorum.
 - c. On the first page of his report, Selden provided a set of questions to help the committee better understand the issue and make decisions. Following is the set of questions as modified by the discussion, as well as the committee responses/conclusions:
 - **Where are we now with disposal component reductions based on special features and applications of drainfield products?** Reduction allowances are noted in the RS&G for gravelless technologies. Based on the soils and the manufacturer's recommendations/specifications, up to a 40% reduction is permitted for some gravelless technologies. For assurance of public health protection, area available for a full size primary and reserve system is required.
 - **Why are special (alternative, proprietary) drainfield products used?**
 - They fulfill the requirements of a drainfield – non-deteriorating, have a void space, present an interface with an infiltrative surface, maintain the integrity of the excavation
 - They have additional helpful features - light weight, free of associated fine soil particles, do not require the use of heavy machinery to place in the trench, can be moved and installed by hand, available for use in gravel-poor areas.
 - They are useable for both pressure and gravity distribution
 - Chambers have an infiltrative surface open for easy observation and exposure for repairs
 - Gravel substitute has an "open top" allowing air migration into the voids
 - **What does the scientific literature say about the hydraulic and treatment performance, as well as the longevity of the alternative drainfield products?** Selden states the conclusions he reached from researching the literature and the recommendations derived from them on page 7 of his report. A representative from Infiltrator took issue with his conclusion that "Field evaluation studies ... provide limited scientifically valid evidence ..." (Selden's comment resulted from the definition of the DOH criteria for literature reviews), but agreed that full area set-asides made sense.
 - **Based on the literature review, should reductions for special features and application of drainfield products be allowed?** Yes – 5 No – 0
 - **If reductions are to be allowed:**
 - **What should the reduction allowances be?**
 - **Chambers?** Maximum of 40% depending on soils
 - **Gravelless pipe?** No reduction allowed
 - **Gravel substitute?** To be discussed at the next meeting
 - **Should 100% primary and reserve absorption areas be required?** Yes – 3 No – 2
 - **Should O&M be required?** Yes – 3 No – 2
 - **When reductions are allowed for Pathway 1, should additional reductions due to Pathway 2 be allowed (increasing the loading rate even further)?** No (decision made earlier while discussing Pathway 1).
8. The balance of the meeting was spent developing question/decision trees for upcoming technical issues.

a. Technical Issue #6 – Type 1A soils issues

- Should 1A & 1B be combined?
- How much treatment can 1A soil do for you?
- How should excessively permeable be defined? What is definition of type 1A soils? Does current definition need to be changed?
- How do we assess risk using type 1 soils?
- Are there treatment concerns when using type 1 soils?
- What should we do when the soil filling the interstitial spaces is finer textured?
- Should type 1A soil be considered a restrictive layer?
- Can vertical separation exist in type 1A soil?
- What adjustment should be made?

b. Technical Issue #7A – Lot size (Minimum Land Area)

- Do we need to make changes in current lot size requirements?
- Where are we currently with minimum land area? What is basis for current requirements?
- Does minimum lot size pertain to new OSS or is it only for development of new lots?
- Should the definition of “development” be changed to distinguish between new lot development and new construction?
- Should minimum lot sizes be different for type 1A soils?
- How does nitrate loading pertain to this?
- Can pretreatment to certain standards lead to reductions in minimum lot sizes?
- Should stacking of houses on side slopes be spoken to? (linear loading rates)

c. Technical Issue #7B – Daily Design Flows

- Link between square footage and daily design flows?
- Should daily flows for residential structures still be determined by # of bedrooms?
- Is the gallonage/bedroom currently used appropriate?
- Should the minimum gallonage (2 bedrooms) be changed?
- Has there been any attempt to equate factors other than bedrooms – ethnicity, bedrooms, flows, etc.
- Should information be on a permit/application be revised to include more info on flows?
- Should we consider a minimum square footage for a residential structure?
- Link with actual flows
- Does daily design flow = peak flow, peak-peak, or what?
- Should I&I be considered?
- Sources for non-residential flows?

ADMINISTRATIVE/OTHER ISSUES

1. The next meeting will be at the same location in Ellensburg on June 5-6, 2002
2. The meeting was adjourned

MEETING MATERIALS¹

Administrative/Other Materials

Meeting Agenda - Revised for April 17-18, 2002

Item #1 – Information on what other states are doing regarding loading rates and other soil characteristics, several papers depicting E. Jerry Tyler’s progression of thought on loading rates over the last decade, copies of e-mail messages between John Eliasson and Dr. Craig Cogger – submitted by John Eliasson

Item #2 – Information on saturated flow and capillary action – submitted by Melanie Kimsey

Item #3 - Rule Development Committee Issue Research Report on Issue T3, Organic loading rates – submitted by Virginia Darrell

Item #4 – Rule Development Committee Issue Research Report on Issue T5, Wastewater Quality/Strength/Content – submitted by Laura Benefield

Item #5 – Questions on Technical Issue #4, Pathway 1 – submitted by Selden Hall

Item #6 – Rule Development Committee Issue Research Report on Issue T1, Treatment Standards 1 & 2 – submitted by John Eliasson

Item #7 – Treatment performance standards in various control zones from Hoover (1998) and Adjusted proposed treatment standards – submitted by John Eliasson

Item #8 – Rule Development Committee Issue Research Report on Issue T4, Pathway 2 – submitted by Selden Hall

¹ All listed meeting materials are maintained by the Department of Health in a meeting manual entitled: *Technical Review Committee Meeting, April 17-18, 2002*. For further information, please contact the Department of Health’s Wastewater Management Program at (360) 236-3062.